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09/816,927	03/23/2001	Franz Auerbach	GR 98 P 2651 P	6167

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EXAMINER

ROSE, KIESHA L

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/816,927

Applicant(s)

AUERBACH ET AL.

Examiner

Kiesha L. Rose

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

This Office Action is in response to the RCE filed 9 December 2002.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1-20 disclose a channel electrically connecting parts of a semiconductor body separated by semiconductor regions. This limitation is not disclosed in the specification and therefore is considered new matter.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-7, 10-14, 16-17 and 20, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. (U.S. Patent 5,175,598) in view of Stengl (U.S. Patent 5,113,237).

In regards to claims 1, 5, 10-12, 16 and 20, Nishizawa discloses a semiconductor-switching device (Fig. 2) that contains a semiconductor body (4,5) of first conductivity type N with, edge regions, having a first and second surface which are opposite to each other, a first electrode (2') formed on the first surface, a second electrode (5') formed on the second surface, a semiconductor zone (2) of second conductivity type P, where a PN junction is formed between, and is in contact with the first electrode (2'), an injector disposed in a surface of the semiconductor body (4,5), semiconductor regions (3) of second conductivity type P with a second doping concentration provided in the semiconductor body (4,5) that are disposed at a respective distance from the semiconductor zone (2) so that the semiconductor regions (3) surround the semiconductor zone (2) in a well shape.

In regards to claims 2, 3, 6, 13, 14 and 17, semiconductor regions (3) that are interrupted by channels formed in the semiconductor body (4,5) at a plurality of locations for increasing voltage where the channels are configured such that electric field spikes are avoided when a reverse voltage is applied between the first and second electrodes and an insulating zone (6) formed on the semiconductor body (4,5) that shields charge carriers.

Nishizawa discloses all of the limitations except for the semiconductor body having a doping concentration greater than  $5 \times 10^{13}$  charge carrier  $\text{cm}^{-3}$ . Whereas

Stengl discloses a semiconductor device (Fig. 1) that contains a semiconductor body (1) with a doping concentration of  $10^{18} \text{ cm}^{-3}$  to properly form conductive regions. (Page 3, lines 55-57) Since Nishizawa and Stengl are both from the same field of endeavor, transistors, the purpose disclosed by Stengl would have been recognized in the pertinent art of Nishizawa. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the switching device of Nishizawa by incorporating the semiconductor body to have a doping concentration of  $10^{18} \text{ cm}^{-3}$  to properly form a conductive region in a semiconductor layer as taught by Stengl.

Claims 4 and 15, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. and Stengl as applied to claim 1 above, and further in view of Siergie et al. (U.S. Patent 5,945,701).

Nishizawa and Stengl disclose all of the limitations except for the semiconductor body having a drift region. Whereas Siergie discloses a static induction transistor (Fig. 12) that contains a semiconductor body, which contains a drift region (38) and channel regions (36) formed in drift region. The drift region is formed so that the charge carriers can flow from one region to the other. (Column 3, lines 27-31) Since Nishizawa, Stengl and Siergie are both from the same field of endeavor, transistors, the purpose disclosed by Siergie would have been recognized in the pertinent art of Nishizawa and Stengl. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the semiconductor devices of Nishizawa and

Stengl by incorporating a drift region in the semiconductor body, which will allow for the charge carriers to flow from one region to the other as taught by Siergie.

Claims 8, 9, 18 and 19, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa et al. and Stengl as applied to claim 1 above, and further in view of Notley (U.S. Patent 5,324,971).

Claims 8 and 18, Nishizawa and Stengl disclose all of the limitations except for the semiconductor body to contain field plates and guard rings. Whereas Notley discloses a semiconductor device (Fig. 4) that contains a semiconductor body (2) that has field plates (20) formed on a surface of the semiconductor body. The field plates are formed on a major surface of the semiconductor body to cause electric fields to spread laterally outward across the active area to increase the breakdown voltage of the semiconductor device. (Abstract)

Claims 9 and 19, the semiconductor body also contains a guard ring (12) that surrounds the edge of the semiconductor body. The guard ring is formed to influence the voltage at the field plate areas. (Column 5, lines 15-24) Since Nishizawa and Stengl are both from the same field of endeavor, transistors, the purpose disclosed by Notley would have been recognized in the pertinent art of Nishizawa and Stengl. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the semiconductor devices of Nishizawa and Stengl by incorporating field plates and guard rings to increase the breakdown voltage of the semiconductor device as taught by Notley.

***R s p o n s e A r g u m e n t s***

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection. In regards to the amendment made 31 October 2002 to claims 1, 11 and 12 referring to the channel electrically connecting parts of a semiconductor body separated by semiconductor regions. As stated previously in the advisory action dated 14 November 2002, this limitation is still considered new matter because the excerpt from the specification that is suppose to disclose this limitation still does not show what is being claimed.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 703-605-4212. The examiner can normally be reached on M-F 8:30-6:00 off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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KLR

January 14, 2003



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